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10/811,312

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EXAMINER

ROSARIO, DENNIS

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2624

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/811,312

Applicant(s)

BODO ET AL.

Examiner

Dennis Rosario

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 8/6/04 1/17/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 20 and 22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows:

Claims 20 and 22 define a "signal" *recorded on a carrier wave/etc.* with functional descriptive material. While functional descriptive material may be claimed as a statutory product (i.e., a "manufacture") when embodied on a tangible computer readable medium, a "signal" per se does not fall within any of the four statutory classes of 35 U.S.C. §101. A "signal" is not a process because it is not a series of steps per se. Furthermore, a "signal" is not a "machine", "composition of matter" or a "manufacture" because these statutory classes "relate to structural entities and can be grouped as 'product' claims in order to contrast them with process claims." (1 D. Chisum, Patents § 1.02 (1994)). Machines, manufactures and compositions of matter are embodied by physical structures or material, whereas a "signal" has neither a physical structure nor a tangible material. That is, a "signal" is not a "machine" because it has no physical structure, and does not perform any useful, concrete and tangible result. Likewise, a "signal" is not a "composition of matter" because it is not "matter", but rather a form of energy. Finally, a "signal" is not a "manufacture" because all traditional definitions of a "manufacture" have required some form of physical structure, which a claimed signal does not have.

A "manufacture" is defined as "the production of articles for use from raw materials or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery." *Diamond v. Chakrabarty*, 447 U.S. 303, 308, 206 USPQ 193, 196-97 (1980) (quoting *American Fruit Growers, Inc. v. Brogdex Co.*, 283 U.S. 1, 11, 8 USPQ 131, 133 (1931)).

Therefore, a "signal" is considered non-statutory because it is a form of energy, in the absence of any physical structure or tangible material, that does not fall within any of the four statutory classes of 35 U.S.C. §101.

NOTE: Refer to Annex IV, section (c) of the USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility", Official Gazette notice of 22 November 2005 (currently at <http://www.uspto.gov/web/offices/com/sol/og/2005/week47/patgupa.htm>).

3. Claims 21-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 21-23 are drawn to functional descriptive material NOT claimed as residing on a computer readable medium. MPEP 2106.IV.B.1(a) (Functional Descriptive Material) states:

"Data structures not claimed as embodied in a computer-readable medium are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer."

"Such claimed data structures do not define any structural or functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized."

Claims 21-23, while defining a computer program, do not define a "computer-readable medium" and is thus non-statutory for that reasons. A computer program can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on "computer-readable medium" in order to make the claim statutory.

"In contrast, a claimed computer-readable medium encoded with the data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory." - MPEP 2106.IV.B.1(a)

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-7,11-15,17-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Vynne et al. (US Patent 5,960,081).

Regarding claim 1, Vynne discloses a method for the watermarking of a sequence of video images, implementing:

a) a step (fig. 2.2,num. 218) for the insertion of at least one watermarking bit into at least one motion vector (see abstract, lines 4-6) obtained by motion estimation between two images of said sequence, so as to obtain at least one watermarked motion vector, said motion vector being identified by its coordinates (see abstract, lines 5,6) in a reference space (fig. 3.2,num. 321), partitioned into two types of complementary zones (corresponding to a sky and house in fig. 2.4B), each having a distinct binary value associated with it (due to watermarking said fig. 3.2,num. 321), said insertion step implementing, if necessary ("if necessary" in col. 31, line 34),

a1) a modification (fig. 10A: "newmotion") of the coordinates of the motion vector so that it is located in a binary value zone corresponding to said watermarking bit to be inserted, wherein, during said modification, at least two potential watermarked motion vectors are determined (since a "selection criteria" in the abstract, line 8 is used) and,

b) from among said potential watermarked motion vectors, an optimal watermarked motion vector is selected according to at least one predetermined criterion ("selection criteria" in the abstract, line 8 and shown in fig. 4.9: CRITERIA), so that the modified coordinates of said motion vector are those of said optimal watermarked motion vector.

Regarding claim 2, Vynne discloses a watermarking method according to claim 1, wherein said predetermined criterion is a criterion of invisibility ("visible artifacts" in abstract, line 7) of said watermarking.

Regarding claim 3, Vynne discloses a watermarking method according to claim 1, wherein said reference space is associated with a reference grid (as shown in fig. 3.2,num. 321) comprising blocks of predetermined dimensions, each of said blocks comprising a zone of each of said types.

Regarding claim 4, Vynne discloses a watermarking method according to claim 3 wherein, said motion vector is located in a reference block of said reference grid, said potential watermarked motion vectors are searched for in a zone (via fig. 3.1,num. 310) of said reference block having a binary value corresponding to said watermarking bit.

Regarding claim 5, Vynne discloses a watermarking method according to claim 4, wherein said potential watermarked motion vectors are also searched for in a binary value zone corresponding to said watermarking bit, belonging to at least one block Adjacent (as shown by the shaded area of fig. 3.2,num. 321) to said reference block.

Regarding claim 6, Vynne discloses a watermarking method according to claim 4, wherein said potential watermarked motion vectors are all the motion vectors ("all motion vectors" in the abstract, line 6) located in said searched zone.

Regarding claim 7, Vynne discloses a watermarking method according to claim 1, wherein said predetermined criterion is a criterion of optimization of a peak signal-to-noise ratio (PSNR) (in col. 4, line 55) associated with each of said potential watermarked motion vectors.

Regarding claim 11, Vynne discloses a watermarking method according to claim 1, wherein said motion estimation is of the "block matching" type (as shown in fig. 3.2,num. 325).

Claim 12 is rejected the same as claim 11. Thus, argument similar to that presented above for claim 11 is equally applicable to claim 129.

Regarding claim 13, Vynne discloses a watermarking method according to claim 12, wherein each of said motion vectors being associated with a region of said image, said motion compensation is implemented on all the regions (or "each block" in col. 13, line 47) of said image, associated with watermarked or non-watermarked motion vectors.

Claim 14 is rejected the same as claim 13. Thus, argument similar to that presented above for claim 13 is equally applicable to claim 14.

Regarding claim 15, Vynne discloses a method for the extraction of a watermark from a video image sequence watermarked according to the method of claim 1, comprising a step for the extraction of at least one watermarking bit inserted into at least one watermarked motion vector, said extraction step comprising the sub-steps of:

- a) motion estimation (fig. 3.6,num. 365) between two images of said sequence, so as to obtain said at least one watermarked motion vector;
- b) analysis of the position (to obtain "a perfect match somewhere" in col. 15, lines 34,35 of matching frames) of said watermarked motion vector in a reference space, partitioned into two types of complementary zones, each of which has a distinct binary value associated with it;
- c) the assigning to said watermarking bit of the binary value of the zone in which said motion vector is located (corresponding to equation 3.2 in col. 15, line 5).

Regarding claim 17, Vynne discloses a method of extraction according to claim 15, wherein, said watermarking bit being inserted redundantly ("redundancy" in col. 16, line 18) into said video image sequence, said method of extraction comprises:

a) a step for the computation of at least one correlation coefficient ("error rate" in col. 16, line 7) used to assign an index of trust to said extracted watermarking bit.

Claim 18 is rejected the same as claim 1. Thus, argument similar to that presented above for claim 1 of a method is equally applicable to claim 18 of a means for.

Claim 19 is rejected the same as claim 15. Thus, argument similar to that presented above for claim 15 is equally applicable to claim 19.

Regarding claim 21, Vynne discloses a computer program (fig. 16, num. 1602) comprising program code instructions for the execution of the steps of the watermarking method according to claim 1, when said program is executed on a computer.

Claim 22 is rejected the same as claims 1 and 21. Thus, argument similar to that presented above for claims 1 and 21 is equally applicable to claim 22.

Claim 23 is rejected the same as claim 21. Thus, argument similar to that presented above for claim 21 is equally applicable to claim 23.

Regarding claims 20 and 24, Vynne discloses a signal (fig. 2.1, num. 211) representing a video image sequence watermarked according to the watermarking method of claim 1.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vynne et al. (US Patent 5,960,081) in view of Han et al. (US Patent 6,845,130 B1).

Regarding claim 8, Vynne does not teach claim 8 but teaches "...the watermark procedure could...take advantage of the...decomposition of the images..." in col. 11, lines 37-39. Thus, Vynne suggests to one of ordinary skill in the art of decomposition of images that decomposition of images provides an advantage for watermarking.

Han teaches a decomposition of images as shown in figure 2 and claim 8 of:

a) an image of said video sequence being associated with at least two hierarchical levels (fig. 2,numerals 22 and 24), said method implements a motion estimation (see title) on at least one pair of images of said sequence for at least one of said levels so as to determine a set of motion vectors (as indicated in figures 3 and 4) of said level, and wherein the motion vectors of a higher hierarchical level (fig. 3,num. 36) are obtained by computing an average ("average" in col. 3, line 21) of the associated motion vectors in the lower level.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Vynne's teaching of decomposition with watermarking with Han's teaching of fig. 2, because Han teaching provides a method of "optimizing the encoding for transmission of motion video images" in col. 1, lines 61,62.

Claim 16 is rejected the same as claim 8. Thus, argument similar to that presented above for claim 8 is equally applicable to claim 16.

8. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vynne et al. (US Patent 5,960,081) in view of Han et al. (US Patent 6,845,130 B1) as applied to claim 8 above, and further in view of Vynne et al. (US Patent 5,960,081).

Regarding claim 9, Han of the combination teaches a watermarking method according to claim 8 comprising:

a) a step for the selection ("selective search" in col. 3, line 10), from among the motion vectors of the highest hierarchical level (fig. 3,num. 38), of at least one motion vector (as shown in fig. 3,num. 38) at which said step for the insertion of a watermarking bit is implemented.

Han of the combination does not teach the claimed insertion of a watermarking bit, but does teach "coding of...motion vector 38" in col. 3, lines 58,59. Thus, Han suggests to one of ordinary skill in the art that motion vectors can be coded using a coding method.

Vynne teaches a coding method and the remaining limitation of claim 9 in claim 1.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Han's teaching of coding motion vectors with Vynne's coding, because Vynne's coding provides protection of video.

Regarding claim 10, Han of the combination teaches a watermarking method according to claim 9, wherein

a) a modification of the coordinates (as shown by the change of direction of vectors of fig. 3 from each level) of said selected motion vector (fig. 3,num. 38) is also applied to the corresponding motion vectors of at least one of said lower levels (fig. 3,num. 36), so as to perform a redundant insertion of said watermarking bit.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario whose telephone number is (571) 272-7397. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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